

# **EXHIBIT 4**



### UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE United States Patent and Trademark Office Address: COMMISSIONER FOR PATENTS P.O. Box 1450 Alexandria, Virginia 22313-1450 www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/429,176	04/23/2009	James A. Cooper	13054-285A	1497
32841 BAHRET & AS	7590 09/22/201 SSOCIATES	0	EXAM	IINER
	ERIDIAN STREET		DANG,	PHUC T
INDIANAPOLIS, IN 46204		IN 46204	ART UNIT	PAPER NUMBER
	•		2892	
			NOTIFICATION DATE	DELIVERY MODE
			09/22/2010	ELECTRONIC

### Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

joyce@bahretlaw.com bahret@bahretlaw.com rfrisk@bahretlaw.com

		Application No.	Applicant(s)			
		12/429,176	COOPER ET AL.			
	Office Action Summary	Examiner	Art Unit			
		Phuc T. Dang	2892			
Period fo	The MAILING DATE of this communication app or Reply	ears on the cover sheet with the c	orrespondence address			
WHIC - Exter after - If NC - Failu Any r	A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.  - Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).					
Status						
1)🖂	Responsive to communication(s) filed on 23 Ag	<u>oril 2009</u> .				
2a) <u></u> □	This action is <b>FINAL</b> . 2b) ☑ This	action is non-final.				
3)	Since this application is in condition for allowar	nce except for formal matters, pro	secution as to the merits is			
	closed in accordance with the practice under E	x parte Quayle, 1935 C.D. 11, 45	33 O.G. 213.			
Dispositi	on of Claims					
5) 6) 7)	4) ☐ Claim(s) 1-3 is/are pending in the application.  4a) Of the above claim(s) is/are withdrawn from consideration.  5) ☐ Claim(s) is/are allowed.  6) ☐ Claim(s) is/are rejected.  7) ☐ Claim(s) is/are objected to.  8) ☐ Claim(s) 1-3 are subject to restriction and/or election requirement.					
Applicati	on Papers					
10)	9) The specification is objected to by the Examiner.  10) The drawing(s) filed on is/are: a) accepted or b) objected to by the Examiner.  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.					
Priority u	ınder 35 U.S.C. § 119					
12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  a) All b) Some * c) None of:  1. Certified copies of the priority documents have been received.  2. Certified copies of the priority documents have been received in Application No  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  * See the attached detailed Office action for a list of the certified copies not received.						
	t(s) e of References Cited (PTO-892) e of Draftsperson's Patent Drawing Review (PTO-948)	4) ☐ Interview Summary Paper No(s)/Mail Da				
3) Inform	nation Disclosure Statement(s) (PTO/SB/08) r No(s)/Mail Date	5) Notice of Informal P. 6) Other:	atent Application			

U.S. Patent and Trademark Office PTOL-326 (Rev. 08-06) Application/Control Number: 12/429,176

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### **DETAILED ACTION**

#### Election/Restriction

- 1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
- Group I, Claims 1-2, drawn to a silicon carbide power MOSFET, classified in class 257, subclass 77.
- II. Group II, Claims 3, drawn to a method of fabricating a silicon carbide MOSFET, classified in class 438, subclass 142.
- 2. The inventions are distinct, each from the other because of the following reasons:
- 3. Inventions I and II are related as method of making and product made.

The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case unpatentability of the Group II invention would not necessarily imply unpatentability of the Group I invention, since the device of Group I invention could be made by a product different from those of the Group II invention. For example, a semiconductor device of Group I can be made is different ways and does not have exactly follow the process of the claims of Group II. In this case, etching the first and second oxide layer without photomask, the etching completely removing the oxide over the silicon carbide adjacent the gate while leaving a portion of the second oxide layer over that gate can be applied by the different processes such as either one of the laser, plasma, chemical, ion etching or sputter-etching .etc...

4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by either different classification, restriction for examination

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purposes as indicated is proper.

If Applicants elected Group II (claims 1-2), this Group contains claims directed to the 5.

following patentably distinct species of the claimed invention:

I. Species I, Claim 1.

II. Species II, Claim 2.

The species are independent or distinct because a first oxide layer on the upper surface of

the drift layer, an oxide layer over the first source region of greater thickness than the first oxide

layer, and an oxide layer over the first gate of substantially greater thickness than the oxide layer

over the first source region of Species I does not require in Species II while a first oxide layer

between the first gate lower surface and the upper surface of the drift layer, a second, thicker

oxide layer over the top surface and sidewalls of the first gate; and a conformal layer of metal

extending laterally across the first gate top surface and sidewall and the adjacent first source

region of Species II does not require in Species I. In addition, these species are not obvious

variants of each other based on the current record.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species, or a single

grouping of patentably indistinct species, for prosecution on the merits to which the claims shall

be restricted if no generic claim is finally held to be allowable. Currently, none claim is generic.

There is a search and/or examination burden for the patentably distinct species as set

forth above because at least the following reason(s) apply:

the species or groupings of patentably indistinct species have acquired a

separate status in the art in view of their different classification.

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■ The species or grouping of patentably indistinct species have acquired a separate status in the art due to their recognized divergent subject matter.

The species or grouping of patentably indistinct species require a different field of search (e.g., searching different classes/subclasses or electronic resources, or employing different search strategies or search queries).

Applicant is advised that the reply to this requirement to be complete <u>must</u> include (i) an election of a species or a grouping of patentably indistinct species to be examined even though the requirement <u>may</u> be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected species or grouping of patentably indistinct species, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

The election may be made with or without traverse. To preserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the election of species requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected species or grouping of patentably indistinct species.

Should applicant traverse on the ground that the species, or groupings of patentably indistinct species from which election is required, are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing them to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of

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the species unpatentable over the prior art, the evidence or admission may be used in a rejection

under 35 U.S.C. 103(a) of the other species.

Upon the allowance of a generic claim, applicant will be entitled to consideration of

claims to additional species which depend from or otherwise require all the limitations of an

allowable generic claim as provided by 37 CFR 1.141.

However, the issues of species I and species II claims are divergent.

Furthermore, there may be some overlap in the searches of the two groups, but there is no reason

to believe that the searches would be identical. Therefore, based on the additional work involved

in searching and examination of the two inventions together, restriction of distinct inventions is

clearly proper.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the

inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the

currently named inventors is no longer an inventor of at least one claim remaining in the

application. Any amendment of inventorship must be accompanied by a diligently-filed petition

under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(h).

Any inquiry concerning this communication or earlier communication from the examiner

should be direct to Phuc T. Dang whose telephone number (571) 272-1776. The examiner can

normally be reached on Monday through Friday from 8.00am to 5.00pm.

/Phuc T Dang/

Primary Examiner, Art Unit 2892

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Attorney Docket No. 13054-285A

### IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of:	)	
	Before the Examiner	
James A. Cooper et al.	)	Date of Filing: October 22, 2010
•	) Phuc T. Dang	I hereby certify that this correspondence is being filed
Serial No. 12/429,176	)	electronically through the USPTO EFS-Web System on the date indicated above.
	Group Art Unit 2892	are sale independent and its
Filed April 23, 2009	)	/William F. Bahret/
	)	William F. Bahret, Reg. No. 31,087
SiC POWER DMOSFET WITH	)	
SELF-ALIGNED SOURCE CONTACTS	)	
AND METHOD FOR MAKING THE SAME	)	

### RESPONSE TO ELECTION/RESTRICTION REQUIREMENT

Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

Sir:

In response to the Office Action dated September 22, 2010, Applicants elect Group I, Species II, identified by the Examiner as drawn to a silicon carbide power MOSFET. Claim 2 is directed to the elected species.

Please provide any extension of time which may be necessary and charge any fees which may be due, except for the issue fee, to Deposit Account No. 50-2176.

The Examiner is invited to call the undersigned attorney if a discussion of any issues relating to this election or to any of the claims in this application might expedite the allowance of this application.

Respectfully submitted,

/William F. Bahret/
William F. Bahret, Reg. No. 31,087
Bahret & Associates LLC
320 N. Meridian St., Suite 510
Indianapolis, Indiana 46204
(317) 423-2300

Electronic Ack	knowledgement Receipt
EFS ID:	8685211
Application Number:	12429176
International Application Number:	
Confirmation Number:	1497
Title of Invention:	SIC POWER DMOSFET WITH SELF-ALIGNED SOURCE CONTACTS AND METHOD FOR MAKING THE SAME
First Named Inventor/Applicant Name:	James A. Cooper
Customer Number:	32841
Filer:	William F. Bahret/Joyce Eden
Filer Authorized By:	William F. Bahret
Attorney Docket Number:	13054-285A
Receipt Date:	22-OCT-2010
Filing Date:	23-APR-2009
Time Stamp:	16:07:02
Application Type:	Utility under 35 USC 111(a)

## Payment information:

Submitted with Payment			no			
File Listing:						
Document Number	Document Decription   File Name   '				Pages (if appl.)	
1	Response to Election / Restriction Filed		Resp2ElectRestrict.pdf	13848	no	1
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Warnings:						
Information:						

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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

#### New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

### National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

### New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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Serial No. 12/429,176 Attorney Docket No. 13054-285A

### IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of:	)	
	) Before the Examiner	
James A. Cooper et al.	)	Date of Filing: November 12, 2010
Social No. 12/420 176	) Phuc T. Dang	I hereby certify that this correspondence is being filed electronically through the USPTO EFS-Web System on
Serial No. 12/429,176	) Group Art Unit 2892	the date indicated above.
Filed April 23, 2009		/William F. Bahret/ William F. Bahret, Reg. No. 31,087
SiC POWER DMOSFET WITH	) )	
SELF-ALIGNED SOURCE CONTACTS	)	
AND METHOD FOR MAKING THE SAME	)	

### **PRELIMINARY AMENDMENT**

Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

Sir:

Please enter the following Preliminary Amendment in the above-identified application prior to examination on the merits. Please charge any fees that may be due or credit any overpayment to Deposit Account No. 50-2176, but not to include any issue fees.

Attorney Docket No. 13054-285A

### **IN THE DRAWINGS:**

The accompanying three drawing sheets, which include changes to Figs. 3, 6 and 8, replace the original drawing sheets containing the same Figs. 3, 6 and 8.

Attorney Docket No. 13054-285A

### **IN THE CLAIMS:**

### Please cancel claims 1 and 3, amend claim 2 and add claims 4-18, as set forth below:

- 1. (Cancelled)
- 2. (Currently amended) A silicon carbide power MOSFET, comprising:
- a silicon carbide wafer having a substrate and a drift layer on said substrate, said drift layer having a plurality of source regions formed adjacent an upper surface thereof;
- a plurality of polysilicon gates above said drift layer, said plurality of polysilicon gates including a first gate adjacent a first of said source regions, said first gate having a top surface, a lower surface and a sidewall, said sidewall overlying said first source region;
- a first oxide layer between said first gate lower surface and said upper surface of said drift layer;
- a second, thicker oxide layer over said top surface and sidewall of said first gate; and[[,]]
- a conformal layer of metal extending laterally across said first gate top surface and sidewall and said adjacent first source region.
  - 3. (Cancelled)
  - 4. (New) A silicon carbide MOSFET structure, comprising:
- a silicon carbide wafer having a substrate body having a source region formed adjacent an upper surface thereof;
  - first and second oxide layers on said upper surface adjacent said source region;
  - a polysilicon gate above each of said first and second oxide layers;
- a gate oxide layer, thicker than said first and second oxide layers beneath said gates, over each of said gates and the sides thereof; and
- a metal or oxide layer over said source region, extending between adjacent gate oxide layers.

Attorney Docket No. 13054-285A

- 5. (New) The silicon carbide MOSFET structure of claim 4, wherein said layer over said source region is an oxide layer of greater thickness than said first and second oxide layers and substantially less thickness than said gate oxide layers.
- 6. (New) The silicon carbide MOSFET structure of claim 4, wherein said layer over said source region is a conformal layer of metal extending laterally across said gates and said source region.
- 7. (New) The silicon carbide MOSFET structure of claim 4, wherein said MOSFET structure has a first state in which said layer over said source region is an oxide layer of greater thickness than said first and second oxide layers and substantially less thickness than said gate oxide layers, and a second state in which said layer over said source region is a conformal layer of metal extending laterally across said gates and said source region.
  - 8. (New) A MOSFET structure, comprising:
- a silicon carbide wafer having a substrate body with an upper surface, said substrate body having at least one source region formed adjacent said upper surface;
- a substrate surface oxidation layer on said upper surface of said substrate body and adjacent said source region;
- at least two polysilicon gates above said substrate surface oxidation layer, said gates each having a top, a bottom and sides, wherein a first source region of said at least one source region is juxtaposed between first and second adjacent gates of said at least two polysilicon gates;
- a gate oxide layer, thicker than said substrate surface oxidation layer, over said tops and sides of each of said gates; and
- a material layer over said first source region and between said gate oxide layers on said sides of said gates, said material layer comprising one of an oxide and a metal contact.
- 9. (New) The MOSFET structure of claim 8, wherein said gate oxide layer is more than eight times thicker than said substrate surface oxidation layer.

Attorney Docket No. 13054-285A

- 10. (New) The MOSFET structure of claim 8, wherein said material layer is a source oxide layer having a thickness greater than that of said substrate surface oxidation layer and less than that of said gate oxide layer.
- 11. (New) The MOSFET structure of claim 10, wherein said source oxide layer includes a first layer homogeneously formed with and of the same thickness as said substrate surface oxidation layer and a second, separately formed layer homogeneously formed with and of lesser thickness than said gate oxide layer.
- 12. (New) The MOSFET structure of claim 8, wherein said material layer is a metal contact layer providing external electrical contact with said at least one source region.
- 13. (New) The MOSFET structure of claim 12 wherein said metal contact layer extends over substantially the entire MOSFET structure except for at least one gate contact access portion, said metal contact layer being in electrical contact with said at least one source region but electrically insulated from said at least two polysilicon gates by at least one of said gate oxide layer and said substrate surface oxidation layer.
- 14. (New) The MOSFET structure of claim 12, wherein said metal contact layer extends over said gates and covers the space between them, said metal contact layer being in electrical contact with said at least one source region but electrically insulated from said gates by at least one of said gate oxide layer and said substrate surface oxidation layer.
- 15. (New) The MOSFET structure of claim 8, wherein said substrate body includes a lower, heavily doped substrate and a lightly doped superjacent drift layer.
- 16. (New) The MOSFET structure of claim 15, wherein said at least one source region is defined in said drift layer.

Attorney Docket No. 13054-285A

- 17. (New) The MOSFET structure of claim 8, wherein said substrate body includes a lower, heavily doped substrate, a lightly doped drift layer superjacent to said substrate, and a current spreading layer (CSL) that is superjacent to said drift layer and that is more heavily doped than said drift layer, but not as heavily doped as said substrate.
- 18. (New) The MOSFET structure of claim 17, wherein said at least one source region is defined in said current spreading layer (CSL).

Attorney Docket No. 13054-285A

#### Remarks

Entry of this Preliminary Amendment prior to examination of this application is respectfully requested.

Non-elected claims 1 and 3 are hereby cancelled without prejudice to Applicants' right to resubmit them in a divisional application. Claims 4-18 are added to the application. At least claims 4 and 8 are believed to be generic as to Group I. Claim 2 is amended to correct a typographical error. No new matter is introduced.

The specification has been amended to:

- 1. Update the Government Rights information.
- 2. Correct several reference number typographical errors.
- 3. Clarify at page 9, line 29 of the specification that a "portion of" polysilicon layer 66 is etched away to create gates 38, as shown in Figs. 4 and 5.
  - 4. To correct the angstrom symbol from "A" to "Å"
- 5. Clarify at page 10, line 15 of the specification the location of step 16a being in Appendix II.
- 6. To correct at page 11, line 10 of the specification reference to gates 38 as comprising polysilicon, as stated at page 9, line 6.
- 7. Clarify at page 11, line 21 of the specification that the short oxide etch is "applied long enough to completely remove the thin oxide layer (comprising previously formed layers 59 and 70), over substrate 28 and between gates 38." In that such "thin oxide layer" is completely removed to "expose the N+ and P+ implants 31, 32 and 33", it is clear that the layer that is removed is considered there to be a combination of *both* of the "previously formed layers 59 and 70". That is, and with reference to Figs. 7 and 8, both layers 59 and 70 must be removed at that location to expose the N+ and P+ implants 31, 32 and 33.

The drawings are amended to correct the location of reference numbers 32 and 33 in Figs. 3 and 8, as supported at page 8, last paragraph, the N+ implant regions being referenced as 31 and 32, and the P+ base being referenced as 33.

Figure 6 of the drawings is amended to add reference number 58a, which is referenced at page 10, line 17 of the specification.

Attorney Docket No. 13054-285A

The Examiner is invited to contact the undersigned at the telephone number listed below in order to expedite the allowance of this application.

Respectfully submitted,

/William F. Bahret/
William F. Bahret, Reg. No. 31,087
Bahret & Associates LLC
320 N. Meridian St., Suite 510
Indianapolis, Indiana 46204
(317) 423-2300



### UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE United States Patent and Trademark Office Address: COMMISSIONER FOR PATENTS P.O. Box 1450 Alexandria, Virginia 22313-1450 www.usplo.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.	
12/429,176	04/23/2009	James A. Cooper	13054-285A	1497	
32841 <b>BAHR</b> ET & A	7590 12/10/201 SSOCIATES	EXAMINER			
320 NORTH MERIDIAN STREET			DANG, PHUC T		
	SUITE 510 INDIANAPOLIS, IN 46204		ART UNIT	PAPER NUMBER	
		2892			
			NOTIFICATION DATE	DELIVERY MODE	
			12/10/2010	ELECTRONIC	

### Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

joyce@bahretlaw.com bahret@bahretlaw.com rfrisk@bahretlaw.com

			C
		Application No.	Applicant(s)
		12/429,176	COOPER ET AL.
	Office Action Summary	Examiner	Art Unit
		Phuc T. Dang	2892
Period fo	The MAILING DATE of this communication app or Reply	ears on the cover sheet with the c	orrespondence address
A SH WHIC - Exter after - If NC - Failu Any r	ORTENED STATUTORY PERIOD FOR REPLY CHEVER IS LONGER, FROM THE MAILING DANSIONS of time may be available under the provisions of 37 CFR 1.13 SIX (6) MONTHS from the mailing date of this communication. Operiod for reply is specified above, the maximum statutory period were to reply within the set or extended period for reply will, by statute, reply received by the Office later than three months after the mailing and patent term adjustment. See 37 CFR 1.704(b).	ATE OF THIS COMMUNICATION 36(a). In no event, however, may a reply be timularly and will expire SIX (6) MONTHS from cause the application to become ABANDONE	<b>J.</b> nely filed the mailing date of this communication. D (35 U.S.C. § 133).
Status			
1)🖂	Responsive to communication(s) filed on <u>Pre-A</u>	Amendment filed on 11/12/2010.	
2a) <u></u> ☐	This action is <b>FINAL</b> . 2b) ☑ This	action is non-final.	
3)□	Since this application is in condition for allowar		
	closed in accordance with the practice under E	x parte Quayle, 1935 C.D. 11, 45	33 O.G. 213.
Dispositi	ion of Claims		
5) 6) 7)	Claim(s) 2 and 4-18 is/are pending in the applic 4a) Of the above claim(s) is/are withdraw Claim(s) is/are allowed.  Claim(s) is/are rejected.  Claim(s) is/are objected to.  Claim(s) 2 and 4-18 are subject to restriction and the application of the applicatio	vn from consideration.	
Applicati	ion Papers		
10)	The specification is objected to by the Examiner The drawing(s) filed on is/are: a) acce Applicant may not request that any objection to the o Replacement drawing sheet(s) including the correcti The oath or declaration is objected to by the Ex	epted or b) objected to by the Edrawing(s) be held in abeyance. See ion is required if the drawing(s) is obj	e 37 CFR 1.85(a). lected to. See 37 CFR 1.121(d).
Priority (	ınder 35 U.S.C. § 119		
a)[	Acknowledgment is made of a claim for foreign  All b) Some * c) None of:  1. Certified copies of the priority documents  2. Certified copies of the priority documents  3. Copies of the certified copies of the prior application from the International Bureau  See the attached detailed Office action for a list of	s have been received. s have been received in Applicati ity documents have been receive ı (PCT Rule 17.2(a)).	on No ed in this National Stage
Attachmen		A) 🗖 Internation Commen	(DTO 442)
2) Notice	ee of References Cited (PTO-892) se of Draftsperson's Patent Drawing Review (PTO-948) mation Disclosure Statement(s) (PTO/SB/08) r No(s)/Mail Date	4)  Interview Summary Paper No(s)/Mail Da 5)  Notice of Informal P 6) Other:	nte

U.S. Patent and Trademark Office PTOL-326 (Rev. 08-06) Application/Control Number: 12/429,176

Art Unit: 2892

### **DETAILED ACTION**

### Preliminary Amendment

The Preliminary Amendment filed on 11/12/2010 has been acknowledged and considered.
 In the Preliminary Amendment, the applicants canceled claims 1 and 3, and added new claims 4-18 and amended claim 2.

Claims 2 and 4-18 are currently pending in the application.

#### Election/Restriction

- 2. The new ground(s) of restriction contains claims directed to the following patentably distinct Species of the claimed invention:
- I. Species I, Claim 2 directed to Fig. 4.
- II. Species II, Claims 4-7 directed to Figs. 1-2.
- IIII. Species III, Claims 8-18 directed to Figs. 3 and 5-8.

The species are independent or distinct because a trench portion having a first oxide layer between the first gate lower surface and the upper surface of the drift layer; and a second, thicker oxide layer over the top surface and sidewalls of the first gate of Species I does not require in Species II and Species III and first and second oxide layers on the upper surface adjacent the source region; and a polysilicon gate above each of the first and second oxide layers of Species II does not require in Species I and Species II and at least two polysilicon gates above the substrate surface oxidation layer, the gates each having a top, bottom and sides, wherein a first source region of the at least one source region is juxtaposed between first and second adjacent gates of the at least two polysilicon gates and a gate oxide layer, thicker than the substrate surface oxidation layer, over the tops and sides of each of the gates of Species III does not require in

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Species I and Species II. In addition, these species are not obvious variants of each other based on the current record.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species, or a single grouping of patentably indistinct species, for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, none claim is generic.

There is a search and/or examination burden for the patentably distinct species as set forth above because at least the following reason(s) apply:

- the species or groupings of patentably indistinct species have acquired a separate status in the art in view of their different classification.
- The species or grouping of patentably indistinct species have acquired a separate status in the art due to their recognized divergent subject matter.
- The species or grouping of patentably indistinct species require a different field of search (e.g., searching different classes/subclasses or electronic resources, or employing different search strategies or search queries).

Applicant is advised that the reply to this requirement to be complete <u>must</u> include (i) an election of a species or a grouping of patentably indistinct species to be examined even though the requirement <u>may</u> be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected species or grouping of patentably indistinct species, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

The election may be made with or without traverse. To preserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out

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supposed errors in the election of species requirement, the election shall be treated as an election

without traverse. Traversal must be presented at the time of election in order to be considered

timely. Failure to timely traverse the requirement will result in the loss of right to petition under

37 CFR 1.144. If claims are added after the election, applicant must indicate which of these

claims are readable on the elected species or grouping of patentably indistinct species.

Should applicant traverse on the ground that the species, or groupings of patentably

indistinct species from which election is required, are not patentably distinct, applicant should

submit evidence or identify such evidence now of record showing them to be obvious variants or

clearly admit on the record that this is the case. In either instance, if the examiner finds one of

the species unpatentable over the prior art, the evidence or admission may be used in a rejection

under 35 U.S.C. 103(a) of the other species.

Upon the allowance of a generic claim, applicant will be entitled to consideration of

claims to additional species which depend from or otherwise require all the limitations of an

allowable generic claim as provided by 37 CFR 1.141.

However, the issues of Species I, Species II and Species III claims are divergent.

Furthermore, there may be some overlap in the searches of the two groups, but there is no reason

to believe that the searches would be identical. Therefore, based on the additional work involved

in searching and examination of the two inventions together, restriction of distinct inventions is

clearly proper.

3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the

inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the

currently named inventors is no longer an inventor of at least one claim remaining in the

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application. Any amendment of inventorship must be accompanied by a diligently-filed petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(h).

4. Any inquiry concerning this communication or earlier communication from the examiner should be direct to Phuc T. Dang whose telephone number (571) 272-1776. The examiner can normally be reached on Monday through Friday from 8.00am to 5.00pm.

/Phuc T Dang/

Primary Examiner, Art Unit 2892

Attorney Docket No. 13054-285A

### IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of:	)	
	) Before the Examiner	
James A. Cooper et al.	)	Date of Filing: January 13, 2011
	) Phuc T. Dang	I hereby certify that this correspondence is being filed
Serial No. 12/429,176	)	electronically through the USPTO EFS-Web System on the date indicated above.
	) Group Art Unit 2892	
Filed April 23, 2009	)	/R. Randall Frisk /
	)	R. Randall Frisk, Reg. No. 32,221
SiC POWER DMOSFET WITH	)	
SELF-ALIGNED SOURCE CONTACTS	)	
AND METHOD FOR MAKING THE SAME	)	

### RESPONSE TO ELECTION/RESTRICTION REQUIREMENT

Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

Sir:

Reconsideration of the application is respectfully requested.

The present application contains pending claims 2 and 4-18 which are the subject of new grounds of restriction as follows:

SPECIES I, claim 2 directed to Fig. 4.

SPECIES II, claims 4-7 directed to Figs. 1-2.

SPECIES III, claims 8-18 directed to Figs. 3 and 5-8.

Applicants provisionally elect Species III, which the Examiner identified as directed to claims 8-18 and Figs. 3 and 5-8. This election is with traverse.

Applicants' attorney thanks Examiner Dang for discussing the restriction requirement by phone on December 29, 2010. Pursuant to that conversation, Applicants offer the following comments.

1. The Examiner has identified Species II as corresponding to claims 4-7 and directed to Figs. 1-2. However, Figs. 1-2 show a conventional DMOSFET (Specification, page 5, lines 3-6 and page 6, lines 21 et seq.). Claim 4 does not read on the device shown in Figs. 1 and 2, as discussed with Examiner Dang, but does read on Figs. 3 and 4 as noted below.

Attorney Docket No. 13054-285A

2. Figs. 3 and 4 should not be considered different species. They show the same device. Fig. 4 simply shows the device shifted one-half cell width laterally from the view of Fig. 3 (Specification, page 5, lines 9-10). Independent claims 2, 4 and 8 all read on the embodiment depicted in Figs. 3 and 4.

Therefore, it is respectfully submitted that the new grounds of restriction are improper and should be withdrawn.

If the Examiner has any other questions or wishes to discuss the matter further, he is invited to contact the undersigned attorney by telephone at 317-423-2300.

Respectfully submitted,

/R. Randall Frisk/

R. Randall Frisk, Reg. No. 32,221 Bahret & Associates LLC 320 N. Meridian St., Suite 510 Indianapolis, Indiana 46204 (317) 423-2300



### UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE United States Patent and Trademark Office Address: COMMISSIONER FOR PATENTS P.O. Box 1450 Alexandria, Virginia 22313-1450 www.uspto.gov

### NOTICE OF ALLOWANCE AND FEE(S) DUE

32841 7590 06/29/2011 BAHRET & ASSOCIATES 320 NORTH MERIDIAN STREET SUITE 510 INDIANAPOLIS, IN 46204 EXAMINER
DANG, PHUC T

ART UNIT PAPER NUMBER
2892

DATE MAILED: 06/29/2011

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/429.176	04/23/2009	James A Cooper	13054-285A	1497

TITLE OF INVENTION: SIC POWER DMOSFET WITH SELF-ALIGNED SOURCE CONTACT

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$755	\$0	\$0	\$755	09/29/2011

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DITE.

### HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

Page 1 of 3

### PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)  32841 7590 06/29/2011  BAHRET & ASSOCIATES  320 NORTH MERIDIAN STREET SUITE 510 INDIANAPOLIS, IN 46204					Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.  Certificate of Mailing or Transmission  I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.					
INDIANAI OLI	.5, 11 40204								(Depositor's name)	
									(Signature)	
			L						(Date)	
APPLICATION NO.	FILING DATE		FIRST NAMED INVENT	VTOR ATTORNEY DOCK		RNEY DOCKET NO.	CONFIRMATION NO.			
12/429,176 TITLE OF INVENTION	04/23/2009 I: SIC POWER DMOSFI	ET WITH SELF-ALIGNI	James A. Cooper ED SOURCE CONTAC	Т			13054-285A	1.	497	
APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DU	E F	PREV. PAID ISSUE	E FEE	TOTAL FEE(S) DUE	DA	TE DUE	
nonprovisional	YES	\$755	\$0		\$0		\$755	09/	/29/2011	
EXAM	MINER	ART UNIT	CLASS-SUBCLASS	$\neg$						
DANG,	PHUC T	2892	438-142000	_						
"Fee Address" ind PTO/SB/47; Rev 03-( Number is required.	ND RESIDENCE DATA less an assignee is ident th in 37 CFR 3.11. Comp	"Indication form ed. Use of a Customer A TO BE PRINTED ON	•	ativel ngle for age attorno be pr type) type)	ly,  firm (having as a ent) and the name eys or agents. If 1 inted.  ent. If an assigne signment.	membes of uno name	er a 2 p to he is 3	ocument has	s been filed for	
Please check the appropr	riate assignee category or	categories (will not be pr	rinted on the patent):	☐ Iı	ndividual 🗖 Co	rporati	on or other private gro	oup entity [	Government	
4a. The following fee(s) are submitted:  ☐ Issue Fee ☐ Publication Fee (No small entity discount permitted) ☐ Advance Order - # of Copies			4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)  A check is enclosed.  Payment by credit card. Form PTO-2038 is attached.  The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number (enclose an extra copy of this form).							
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NOTE: The Issue Fee an	ns SMALL ENTITY statu and Publication Fee (if requirecords of the United Sta	uired) will not be accepte	b. Applicant is no led from anyone other that	_	_				*	
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Authorized Signature  Typed or printed name										
** *	nation is required by 37 C titality is governed by 35 d application form to the ions for reducing this burylrginia 22313-1450. DO 313-1450.	FR 1.311. The informatic U.S.C. 122 and 37 CFR USPTO. Time will vary rden, should be sent to th NOT SEND FEES OR (	on is required to obtain on the control of the cont		ain a benefit by the nated to take 12 neual case. Any could U.S. Patent and THIS ADDRESS	ne publ ninutes mment Fraden . SENI	lic which is to file (and to complete, includin so on the amount of tin nark Office, U.S. Depa D TO: Commissioner	by the USF g gathering, ne you requ artment of C for Patents, I		



### United States Patent and Trademark Office

UNITED STATES DEPARTMENT OF COMMERCE United States Patent and Trademark Office Address: COMMISSIONER FOR PATENTS P.O. Box 1450 Alexandria, Virginia 22313-1450 www.usplo.gov

APPLICATION NO. FILING DATE FIRST NAMED INVENTOR ATTORNEY DOCKET NO. CONFIRMATION NO. 12/429,176 04/23/2009 James A. Cooper 13054-285A 1497 EXAMINER 32841 06/29/2011 7590 **BAHRET & ASSOCIATES** DANG, PHUC T 320 NORTH MERIDIAN STREET ART UNIT PAPER NUMBER **SUITE 510** INDIANAPOLIS, IN 46204 2892

DATE MAILED: 06/29/2011

### Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)

(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 91 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 91 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

### **Privacy Act Statement**

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

- 1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
- 2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
- 3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
- 4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
- 5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
- 6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
- 7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
- 8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
- 9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

	Application No.	Applicant(s)					
	12/429,176	COOPER ET AL.					
Notice of Allowability	Examiner	Art Unit					
	PHUC DANG	2892					
The MAILING DATE of this communication apperature All claims being allowable, PROSECUTION ON THE MERITS IS herewith (or previously mailed), a Notice of Allowance (PTOL-85) NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIOF of the Office or upon petition by the applicant. See 37 CFR 1.313	(OR REMAINS) CLOSED in this ap or other appropriate communication GHTS. This application is subject to and MPEP 1308.	plication. If not included not will be mailed in due course. THIS					
2. X The allowed claim(s) is/are 2 and 4-18 (renumbered as in a	new claims 1-16)						
3. Acknowledgment is made of a claim for foreign priority ur  a) All b) Some* c) None of the:  1. Certified copies of the priority documents have  2. Certified copies of the priority documents have  3. Copies of the certified copies of the priority documents have  International Bureau (PCT Rule 17.2(a)).  * Certified copies not received:	nder 35 U.S.C. § 119(a)-(d) or (f).  be been received.  been received in Application No						
Applicant has THREE MONTHS FROM THE "MAILING DATE" noted below. Failure to timely comply will result in ABANDONM THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.		complying with the requirements					
4. A SUBSTITUTE OATH OR DECLARATION must be subm INFORMAL PATENT APPLICATION (PTO-152) which give							
5. CORRECTED DRAWINGS ( as "replacement sheets") mus  (a) including changes required by the Notice of Draftspers  1) hereto or 2) to Paper No./Mail Date  (b) including changes required by the attached Examiner's Paper No./Mail Date  Paper No./Mail Date  Identifying indicia such as the application number (see 37 CFR 1 each sheet. Replacement sheet(s) should be labeled as such in the paper No./Mail Date and the paper No./Mail Date are the paper No./Mail Date and the paper No./Mail Date are the paper No.	on's Patent Drawing Review (PTO- s Amendment / Comment or in the C .84(c)) should be written on the drawing the header according to 37 CFR 1.121(	Office action of ngs in the front (not the back) of d).					
DEPOSIT OF and/or INFORMATION about the depo- attached Examiner's comment regarding REQUIREMENT							
Attachment(s)  1. ☐ Notice of References Cited (PTO-892)  2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)  3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date	<ol> <li>5. ☐ Notice of Informal F</li> <li>6. ☐ Interview Summary</li> <li>Paper No./Mail Da</li> <li>7. ☐ Examiner's Amendo</li> </ol>	(PTO-413), te					
Examiner's Comment Regarding Requirement for Deposit of Biological Material	8. ☐ Examiner's Stateme	<ul><li>8.  Examiner's Statement of Reasons for Allowance</li><li>9.  Other</li></ul>					
/Phuc T Dang/ Primary Examiner, Art Unit 2892							

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